

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

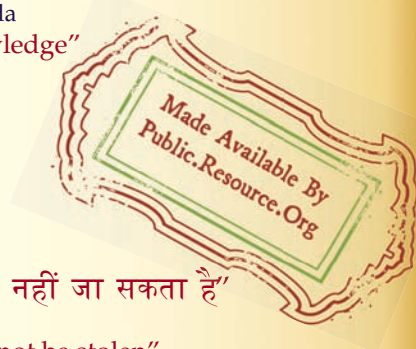
IS 14691 (1999): Rolling Bearings - Taper Rolling Bearings
- Tapered Roller - Metric Series [PGD 13: Bearing]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 14691 : 1999

(Reaffirmed 2004)

भारतीय मानक

रोलिंग बेयरिंग — शुंडाकार रोलिंग बेयरिंग — शुंडाकार
रोलर — मीटरी शृंखला — विशिष्ट

Indian Standard

ROLLING BEARINGS — TAPER ROLLING
BEARINGS — TAPERED ROLLER — METRIC
SERIES — SPECIFICATION

ICS 21.100.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Rolling Bearings Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

The technical committee responsible for the formulation of Indian Standards on rolling bearings has decided to formulate standard on tapered rollers used in tapered rolling bearings in line with the current international practices. Since the standards are already available on cylindrical rollers and needle rollers. The committee felt necessary to have standard on tapered rollers which would fill-up the gap in system standardization.

While preparing this standard, considerable assistance has been derived from JIS B 1506-1991 'Rollers for roller bearings', published by the Japanese Industrial Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off values should be the same as that of the specified value in this standard.

Indian Standard

ROLLING BEARINGS — TAPER ROLLING BEARINGS — TAPERED ROLLER — METRIC SERIES — SPECIFICATION

1 SCOPE

1.1 This standard covers the requirements for finished tapered rollers used in rolling bearings.

1.1.1 This standard does not cover special purpose tapered rollers.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No./ISO No.</i>	<i>Title</i>
2500 (Part 1) : 1992/ ISO 2859-1 : 1989	Sampling inspection procedures: Part 1 Attribute sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection (<i>second revision</i>)
4398 : 1994	Carbon chromium steel for manufacture of balls, rollers and bearing races (<i>second revision</i>)
5489 : 1975	Carburizing steels for use in bearing industry (<i>first revision</i>)

3 SHAPE

3.1 The shape of the tapered rollers shall be as shown in Fig. 1. ΦD_w expresses a diameter of an imaginary circle, which is given by the intersection of the rolling contact surface with the sliding surface of the large end face. Shape of end face shall be spherical (ΦD_w , Φ and R shall be specified by the purchaser).

4 TOLERANCE

4.1 Tolerance on tapered rollers shall be in accordance with Table 1.

4.2 The tapered rollers covered in this standard are classified into two classes as follows :

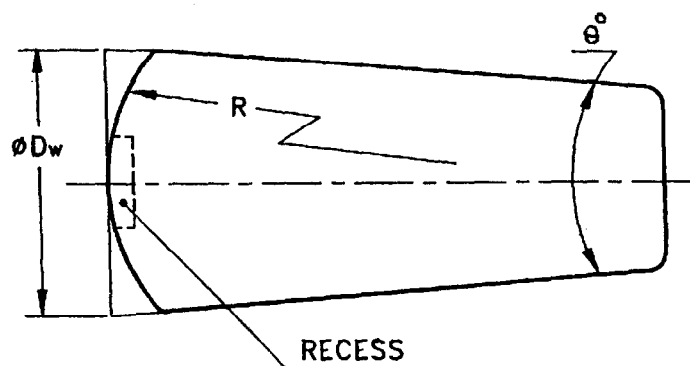
N = normal class
P = precision class

4.2 Tolerance on Sine-Block

Taper on outside diameter shall be within:

± 0.002 mm for Normal class, and
 ± 0.001 mm for Precision class.

4.3 The large end is to have a convex spherical linearity having 50 to 80 percent ratio of contact on a circular blockage.



NOTE — The recess details shall be specified by the purchaser.

FIG. 1 TAPERED ROLLER

5 HARDNESS

Hardness of rollers shall be taken as hardness on flat surface as HRC 60 to 66.

Table 1 Tolerance on Tapered Roller
(Clause 4.1)

Nominal Diameter ΦD_w mm	Out of Roundness (microns), Max ¹⁾		Lot Diameter Variation (microns), Max		Side Runout with Outside Surface (microns), Max	
	N	P	N	P	N	P
Over 3 up to 10	1.5	1	3	1	10	6
Over 10 up to 18	2.0	1	4	1.5	13	8
Over 18 up to 30	2.0	1.5	5	2	17	10
Over 30 up to 50	3.0	2	6	2.5	20	12
Over 50 up to 80	4.0	3	7	3	23	15

¹⁾ Measuring method for out of roundness to be by Taly Rond or equivalent machine and no lobbing error is permitted (such as 3 or 5 lobe, etc).

6 FINISH

6.1 Rolling contact surface and sliding surface of rollers shall be precisely finished, and shall be free from injurious defects such as cracks, flaws and rust.

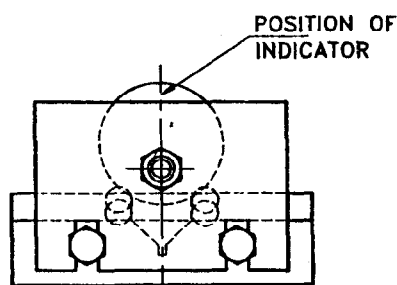
6.2 The surface roughness of the precisely finished rolling contact surfaces shall be in accordance with Table 2.

Table 2 Surface Roughness

Nominal Dimensions of Diameter ΦD_w (mm)	Up to and Including 18 mm Diameter	Over 18 Up to and Including 50 mm Diameter	Over 50 mm Diameter
Allowable N	0.10	0.15	0.20
Surface roughness Ra (μ m) P	0.06	0.10	0.15

6.3 Crowning on Outside Diameter

The details of crowning on outside diameter shall be as per the mutual agreement between the manufacturer and the purchaser.



7 MATERIAL

Material for tapered rollers shall be conforming to IS 4398 or IS 5489 whichever is applicable.

8 DESIGNATION

The tapered rollers conforming to this standard shall be designated by the name, nominal diameter, class, nominal angle (θ) and number of this Indian Standard.

Example:

A taper roller of normal class having nominal diameter 10 mm and normal taper angle (θ) 4° shall be designated as under:

Tapered Roller/10 N/ 4° /IS 14691

9 SAMPLING AND TESTING

9.1 Sampling

Unless otherwise agreed to between the manufacturers and the purchaser, the sampling procedure as given in IS 2500 (Part 1)/ISO 2859-1, shall be followed.

9.1.1 For dimensions single sampling plan with Inspection Level III and Acceptance Quality Level (AQL) 2.5 percent for normal class and 1 percent for precision class as given in Tables 1 and 2 of IS 2500 (Part 1)/ISO 2859-1, shall be followed.

10 MEASURING METHODS

10.1 Measuring methods for diameter and outside surface shall be in accordance with the **10.1.1** and **10.1.2** respectively.

10.1.1 Diameter

Measurement of diameter is made at a fixed distance from large end face, generally using two point measuring instrument and comparison shall be made with a standard roller.

NOTE—Standard roller mentioned here shall be a roller having similar dimensions to the basic size and having evidently known dimensions.

10.1.2 Side Runout With Outside Surface

Measurement of the side runout with outside surface shall generally be made, placing a roller on a supporting block as shown in Fig. 2, by taking the displacement

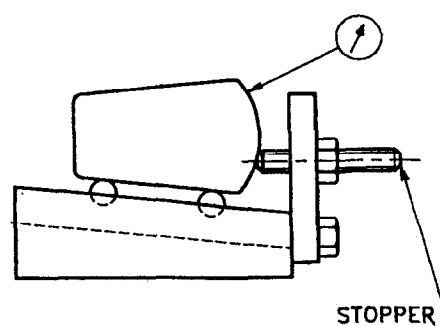


FIG. 2 SIDE RUNOUT WITH OUTSIDE SURFACE

of an indicator when the roller is rotated one revolution, while the large end face being kept in point contact with a stopper at a point near periphery and the indicator being applied onto a position diametrically opposite to that contact point on the same end face. Moreover hardness of supporting block shall be not less than HRC 58.

10.2 Visual Inspection

Taper roller outside diameter and end face shall be free from visual defects such as unclear surface, chatter marks, grinding marks, grinding lines, cavities, pits and pin holes.

11 MARKING

11.1 The packed containers shall be marked with manufacturer's name or trade-mark (if any), designation of the tapered rollers, date of manufacture or code indicating the date of manufacture, and quantity.

11.2 BIS Certification Marking

The product conforming to this standard may also be marked with the Standard Mark.

11.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

12 PACKING

12.1 Tapered rollers shall be protected from rust by the application of suitable anti-corrosive oil or grease and packed suitably.

12.2 Each grade of tapered rollers shall be packed separately.